

NEWS RELEASE

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For Immediate Release

CUMMINS ADOPTS ADI'S BEACON SAFETY-CRITICAL TECHNOLOGIES FOR DEVELOPING DIESEL ENGINE CONTROLLERS

Ann Arbor, Michigan - Applied Dynamics International (ADI) today announced that its BEACON software technology has been selected by Cummins Engine Company (Columbus, IN) as the primary development tool for the next generation of embedded electronic engine control application software. Cummins' expects significant improvements with software reuse across many of their embedded applications including most of Cummins' medium and heavy-duty diesel engine electronic controllers. BEACON enhances the quality of Cummins' software detailed designs, code, and unit test coverages by providing a graphical design package, fixed-point C code generator, and Automatic Unit Test Tool (AUTT) suitable for developing high-integrity embedded software.

"BEACON was an excellent fit into the current Cummins production embedded software development environment and configuration management system," said David Redding, Controls Team Manager at Cummins. "The BEACON technology enables the adoption of a disciplined software design process where software detailed design documentation is a product of the production process and not an afterthought. Initial results have indicated significant improvement in both software design quality and development cost for the production software process. Additionally, analysis indicates BEACON should greatly improve software reuse attributed to the graphical representation of software algorithms designed with BEACON."

Using BEACON's design analysis features and fixed-point C code generators, Cummins will more efficiently translate control and monitoring algorithms into production software. BEACON's AUTT plays a key role with automation of software unit testing and strengthens

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the overall test verification strategy. AUTT provides a rigorous suite of unit test vectors that allow Cummins to fully exercise the software instructions in the target environment, thus identifying errors well before expensive integration and system level testing. The graphical representation of control and monitoring algorithms, automated code generation, and streamlined unit testing greatly reduces software life-cycle costs.

“Cummins’ decision to adopt BEACON shows again that safety-critical software development methods are not restricted to jet engines, pacemakers, and nuclear power plants,” said Tom Erkkinen, ADI’s BEACON Product Manager. “Any company that desires software that is safe, reliable, and maintainable, needs to consider safety-critical development practices, especially those that provide significant levels of process automation.”

In developing controller software, a Cummins software engineer first uses BEACON to develop a detailed software design using signal flow and control flow diagrams. The BEACON design analyzer is then invoked to ensure that a number of commonly accepted software principals have been satisfied, such as strong data typing and single entry/exit. If the design successfully passes these checks, the software engineer generates code and test cases. The test cases are then run with the automatically produced source code to stress the extremities of the mathematical computations and control flow expressions.

Cummins, headquartered in Columbus, Indiana, is the world’s largest producer of diesel engines above 200 horsepower. The company provides products for customers in its key markets: automotive, power generation, industrial and filtration. Cummins reported record sales of \$6.3 billion in 1998.

Applied Dynamics International is a supplier of advanced embedded controller design and test tools for the automotive, off-highway, aerospace, defense and other related industries. In addition to its Michigan headquarters, ADI has an international office in the United Kingdom, installations in 23 countries and representatives throughout the world.

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